

CLAIMS

1. A near-infrared absorbent green glass composition comprising, in mass %:

65 to 80% SiO_2 ,

5 0 to 5% B_2O_3 ,

0 to 5% Al_2O_3 ,

0 to 10% MgO ,

5 to 15% CaO ,

10 to 18% Na_2O ,

10 0 to 5% K_2O ,

0 to 2% TiO_2 ,

0.05 to 0.5% SO_3 ,

0.6 to 1.3% T- Fe_2O_3 which means a total iron oxide amount in terms of Fe_2O_3 ,

15 0 to 2.0% CeO_2 and, in mass ppm,

300 ppm or less MnO ,

wherein a total content of MgO and CaO is from 5 to 20 mass %,

a total content of Na_2O and K_2O is from 10 to 20 mass %,

a FeO ratio represented by a mass ratio of FeO converted into Fe_2O_3 relative

20 to said T- Fe_2O_3 is from 0.21 to 0.35, and

at least one of the following a) and b) is satisfied:

a) when the near-infrared absorbent green glass composition is formed to have a thickness in the range of 1.3 to 2.4 mm, a visible light transmittance measured by using CIE illuminant A is at least 80%, a total solar energy transmittance is 62% or less, a dominant wavelength measured by using CIE illuminant C is from 500 to 540 nm, and an integrated value obtained by integrating transmittances of every 1 nm in the wavelength from 1100 to 2200 nm is 62000 or less;

b) when the near-infrared absorbent green glass composition is formed to have a thickness in the range of 3 to 5 mm, a visible light transmittance measured by using CIE illuminant A is at least 70%, a total solar energy transmittance is 45% or less, a dominant wavelength measured by using CIE illuminant C is from 495 to 540 nm, and an integrated value obtained by integrating transmittances of every 1 nm in the wavelength from 1100 to 2200 nm is 62000 or less.

2. The near-infrared absorbent green glass composition according to claim

1, wherein said FeO ratio is from 0.26 to 0.35.

3. The near-infrared absorbent green glass composition according to claim 1, wherein the content of said T-Fe₂O₃ is from 0.60 to 0.77 mass % and the content of CeO₂ is from 0.55 to 2.0 mass %.

4. The near-infrared absorbent green glass composition according to claim 2, wherein the content of CeO₂ is from 0.1 to 2.0 mass % and said FeO ratio is more than 0.275 and not more than 0.35.

5. The near-infrared absorbent green glass composition according to claim 1, wherein the content of CeO₂ is from 0.1 to 1.4 mass %.

6. The near-infrared absorbent green glass composition according to claim 2, wherein said FeO ratio is more than 0.29 and not more than 0.35.

7. The near-infrared absorbent green glass composition according to claim 1, wherein the content of CeO₂ is from 0.65 to 2.0 mass %.

8. The near-infrared absorbent green glass composition according to claim 2, wherein the content of said T-Fe₂O₃ is from 0.70 to 0.77 mass %, said FeO ratio is from 0.275 to 0.35, and the content of CeO₂ is from 0.65 to 1.4 mass %.

9. The near-infrared absorbent green glass composition according to claim 8, which is formed to have a thickness in the range of 2.1 to 2.4 mm.

10. The near-infrared absorbent green glass composition according to claim 2, wherein the content of said T-Fe₂O₃ is from 0.78 to 0.90 mass %, said FeO ratio is from 0.265 to 0.30, and the content of CeO₂ is from 0.65 to 0.90 mass %.

11. The near-infrared absorbent green glass composition according to claim 10, which is formed to have a thickness in the range of 2.0 to 2.2 mm.

12. The near-infrared absorbent green glass composition according to claim 2, wherein the content of said T-Fe₂O₃ is from 0.77 to 0.80 mass % and

said FeO ratio is from 0.30 to 0.35.

13. The near-infrared absorbent green glass composition according to claim 12, which is formed to have a thickness in the range of 2.0 to 2.2 mm.

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14. The near-infrared absorbent green glass composition according to claim 1, wherein said T-Fe₂O₃ is more than 0.90 mass % and not more than 0.98 mass %, said FeO ratio is from 0.21 to 0.28, and the content of CeO₂ is 0.50 mass % or more.

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15. The near-infrared absorbent green glass composition according to claim 14, which is formed to have a thickness in the range of 1.7 to 1.9 mm.

16. The near-infrared absorbent green glass composition according to claim 2, wherein the content of said T-Fe₂O₃ is from 0.98 to 1.3 mass % and said FeO ratio is from 0.275 to 0.35.

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17. The near-infrared absorbent green glass composition according to claim 16, which is formed to have a thickness in the range of 1.3 to 1.8 mm.

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18. The near-infrared absorbent green glass composition according to claim 1, wherein the content of MnO is from 30 to 300 mass ppm.

19. The near-infrared absorbent green glass composition according to claim 1, wherein in at least one of said a) and said b), an ultraviolet transmittance is 42% or less.

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20. The near-infrared absorbent green glass composition according to claim 19, wherein the ultraviolet transmittance is 40% or less a') when the near-infrared absorbent green glass composition is formed to have a thickness in the range of 1.3 to 2.0 mm.

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21. The near-infrared absorbent green glass composition according to claim 2, which is formed to have a thickness t (mm) of in the range of 1.3 to 2.4 mm and wherein TFe (mass %) which is the content of said T-Fe₂O₃ falls within the range expressed by the following equation

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$$1.8 \cdot 0.5t \leq TFe \leq 1.9 \cdot 0.5t$$

and said FeO ratio is from 0.275 to 0.35.

22. The near-infrared green glass composition according to claim 21, wherein TCe (mass %) which is the content of CeO₂ is 0 or more, and falls within the range expressed by the following equation.

$$t \cdot 1.8 \leq TCe \leq t \cdot 0.8$$

23. A laminated glass formed by laminating at least two glass sheets through a thermoplastic resin layer, wherein at least one of said glass sheets comprises the near-infrared green glass composition according to claim 1.

24. The laminated glass according to claim 23, wherein at least two of the said glass sheets comprise the near-infrared absorbent green glass composition according to claim 1.

25. The laminated glass according to claim 23, wherein a visible light transmittance measured by using CIE illuminant A is 70% or more and a total solar energy transmittance is 45% or less.

26. The laminated glass according to claim 25, wherein a ratio of said total solar energy transmittance relative to said visible light transmittance is 0.60 or less.

27. The laminated glass according to claim 23, wherein a transmittance at the wavelength of 1550 nm is 37% or less.

28. The laminated glass according to claim 23, wherein an integrated value obtained by integrating transmittances of every 1 nm in the wavelength from 1100 to 2200 nm is 34000 or less.

29. The laminated glass according to claim 23, wherein a transmittance for thermal feeling is 44% or less.